

## CLAIMS

I claim:

1. A method for producing a composite motion picture image on a stage using live images of characters and set components combined with computer generated images, the method comprising:

generating a database of computer generated image element signals indicative of computer generated images, each image having a plurality of computer image elements, with a pre-established geometric position relative to one another;

generating a database of computer image element position signals correlating the position of each of the image elements in a stage geometry;

recording character and set image element signals indicative of live character and set component images within the stage geometry, each image having a plurality of character and set image elements;

recording, simultaneously with the live character and set image element signals, character and set position signals which associate a character or set component position with a corresponding position in the stage geometry,

generating recording apparatus position signals indicative of the position of a recording apparatus in the stage geometry and optical field signals indicative of the optical field of view of the recording apparatus for the live character and set component images;

generating optical parameter signals corresponding to the optical parameters of the recording apparatus;

modifying the computer image element position signals in dependence on values of the recording apparatus position signals, optical parameter signals and optical field signals;

identifying select ones of the character and set image element signals to be replaced by select ones of the computer generated image element signals in dependence on the computer image element position signals and the character and set position signals;

30 substituting the identified character and set image element signals with  
corresponding ones of the computer generated image element signals to form a  
set of initial composite image signals;

generating in substantially real time an initial composite image of the live  
character and set component images and the computer generated images from  
the initial composite image signals; and

35 presenting, in substantially real time, the initial composite image to a  
display associated with the recording apparatus.

204720 23965001

2. The method of claim 1 comprising:  
transmitting the character and set image element signals, and the  
character and set position signals to a user interface; and  
generating the initial composite image signals at the user interface.
3. The method of claim 2 comprising transmitting the initial composite  
image signals from the user interface to the display.
4. The method of claim 1 comprising modifying the initial composite image  
signals to form a set of final composite image signals in dependence on viewing  
the displayed initial composite image.
5. The method of claim 4 comprising generating a composite motion picture  
image from the final composite image signals for storage on a medium.

6. A system for producing a composite motion picture image on a stage having a lighting system using live images of characters and set components combined with computer generated images, said system comprising:

5 a database of computer generated images, each image having a plurality of image elements with a pre-established geometric position relative to one another;

a database of signals correlating the position of each of said image elements in a stage geometry;

10 a means for storing said computer image database on a computer system;

apparatus for recording live character and set component images within said stage geometry;

15 apparatus for recording, simultaneously with said live character and set images, signals which associate a character or set component position with a corresponding position in the stage geometry,

apparatus for generating data signals indicative of the position of said recording device in the stage geometry and signals indicative of the optical field of view of said recording device;

20 apparatus for generating signals corresponding to the optical parameters of said recording device, including values of F-stop and focal length;

apparatus for modifying said computer image elements in dependence on values of said recording device optical parameters and said optical field of view;

25 apparatus for identifying select ones of said image elements of said live and character set images to be replaced by computer generated image components;

apparatus for substituting said identified computer generated image components for corresponding ones of said live character and set images

30 apparatus for generating in real time an initial composite image of said live character and set image and said computer generated image; and

apparatus for presenting, in real time, said initial composite image to a display associated with said recording device.

1009955-031402  
2041ED 29966001

means for determining and controlling the parameters of said lighting system in dependence on said database of computer generated images.

7. The system of claim 6 further comprising a means for transmitting said initial composite image to an editor and editing said composite image.
8. The system of claim 6 further comprising a means for rendering said initial composite image into a final image for storage on a medium.
9. The system of claim 6 further comprising a means for generating a new composite image in dependence on viewing said displayed initial composite image.
10. The system of claim 8 further comprising a means for rendering said new composite image into a final image for storage on a medium.
11. The system of claim 6 further comprising an apparatus for self-suspended movement of said recording apparatus and said display about said stage geometry, and including means for recording the position and optical orientation of said recording apparatus.

FILED 2009 DEC 23 14 02

12. A recording apparatus and display and associated support system comprising:

a base engaged with a movable dolly;

a boom arm pivotally mounted to the body;

5 a jib arm pivotally mounted to a distal end of the boom arm;

a recording apparatus mounting flange pivotally mounted to a distal end of the jib arm;

a counterweight system for counterbalancing the boom arm and jib arm;

10 a recording apparatus mounted to the recording apparatus mounting flange, the recording apparatus recording live character and set component images; and

15 a display disposed proximate to the recording apparatus, the display presenting substantially real time generated initial composite images indicative of the live character and set component images and computer generated images.

13. The recording apparatus support system of claim 12 comprising a motion tracking system for generating recording apparatus position signals indicative of the position of the recording apparatus, wherein the recording apparatus position signals are used to generate initial composite image signals indicative of the initial composite images.

5

14. The recording apparatus support system of Claim 13 wherein the initial composite image signals are generated from a method comprising:

generating a database of computer generated image element signals indicative of computer generated images, each image having a plurality of computer image elements, with a pre-established geometric position relative to one another;

generating a database of computer image element position signals correlating the position of each of the image elements in a stage geometry;

recording character and set image element signals indicative of the live character and set component images within the stage geometry, each image having a plurality of character and set image elements;

recording, simultaneously with the live character and set image element signals, character and set position signals which associate a character or set component position with a corresponding position in the stage geometry,

generating the recording apparatus position signals indicative of the position of a recording apparatus in the stage geometry and optical field signals indicative of the optical field of view of the recording apparatus for the live character and set component images;

generating optical parameter signals corresponding to the optical parameters of the recording apparatus;

modifying the computer image element position signals in dependence on values of the recording apparatus position signals, optical parameter signals and optical field signals;

identifying select ones of the character and set image element signals to be replaced by select ones of the computer generated image element signals in dependence on the computer image element position signals and the character and set position signals;

substituting the identified character and set image element signals with corresponding ones of the computer generated image element signals to form the initial composite image signals.

15. The recording apparatus support system of claim 12 wherein the counterweight system and the counterbalanced boom and jib arms provide substantially weightless movement of the recording apparatus and display for an operator.

16. The recording apparatus support system of claim 15 comprising:  
a position control system for controlling position of the boom arm and jib arm relative to position of the counterweight system;

a boom cylinder for supporting the boom arm and operatively connected between the body and the boom, the boom cylinder responsive to boom arm position signals generated from the position control system; and

a jib cylinder for supporting the jib arm and operatively connected between the boom arm and the jib arm, the jib cylinder responsive to jib arm position signals generated from the position control system;

wherein the boom arm position signals and the jib arm position signals enable the counterweight system and the counterbalanced boom and jib arms to provide substantially weightless movement of the recording apparatus and display for an operator.

17. The recording apparatus support system of claim 16 wherein the counterweight system comprises:

a counterweight boom arm for counter balancing the boom arm, pivotally mounted on an opposing side of the body relative to the boom arm, and

a counterweight jib arm for counter balancing the jib arm, pivotally mounted to a distal end of the counterweight boom arm.



18. A recording apparatus support system comprising  
a base including a body rotatably mounted to a movable dolly;  
a boom arm pivotally mounted to the body;  
a jib arm pivotally mounted to a distal end of the boom arm;  
5 a recording apparatus mounting flange pivotally mounted to a distal end  
of the jib arm;  
a recording apparatus mounted to the recording apparatus mounting  
flange;  
a display disposed proximate to the recording apparatus; and  
10 a counterweight system for counterbalancing the boom arm and jib arm;  
wherein the counterweight system provides substantially weightless  
movement of the recording apparatus and display by an operator.

19. The recording apparatus support system of claim 18 wherein the  
counterweight system comprises:

a counterweight boom arm for counter balancing the boom arm,  
pivotally mounted on an opposing side of the body relative to the boom arm,  
5 and

a counterweight jib arm for counter balancing the jib arm, pivotally  
mounted to a distal end of the counterweight boom arm.

20. The recording apparatus support system of claim 19 comprising:

a boom cylinder for supporting the boom arm and operatively connected  
between the body and the boom, the boom cylinder responsive to signals from  
a control system; and

5 a jib cylinder for supporting the jib arm and operatively connected between the  
boom arm and the jib arm, the jib cylinder responsive to the control system  
signals.

2014-09-23 10:09:56